

Application Number :10/021,656
Applicant :Gary C. Johnson
Application Filed :12-12-2001
Art Unit :3681
Examiner : Dirk Wright

CLAIMS

Cancel claims; 11 and 12.

Enter claims; 13 and 14, found on pages (1) - (4).

Renumber all pages and claims, when and where necessary.

Note: Claim number 14 is a dependent claim.

IN THE USPTO

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CLAIMS

I claim:

Claim 13 (new), a self controlled , self contained vehicle combination differential that when driven, will rotates both drive wheels under all road conditions allowing neither drive axle / wheel to over-spin, said combination differential yet allowing inversely proportional drive axle / wheel rotation variability, said differential having the above said advantages using all gear drive / driven members, said differential having continuous engagement members, not needing / having any braking means, clutches nor intermittent locking devices, said differential working the same, whether in forward or reverse vehicle drive, said differential gear including:

a rotatable differential case (8), drivable for rotation;

a first differential gear mechanism of said two differential mechanisms in said rotatable differential case (8):

freely rotatable bevel pinion gears (13,14) mounted in said housing (8) for rotation therewith; and

differential side bevel gears (11,12) mounted in said differential case (8), meshing with said bevel pinion gears (13,14), said side bevel gears (11,12) being freely rotatable relative to said differential gear housing (8) said side bevel gears each being stationary to an output shaft / axle (5,10), whether directly or indirectly;

Claim – 13 (continued)

the said fully controlled vehicle differential gear, further including;

a second differential gear mechanism of said two differential mechanisms including:

a support structure (9), two sun gears (6,7), at least one planet gear (15,16), one input shaft (19), and two output shafts (5,10);

wherein:

(a) said support structure (9) is axially and independently rotatable in the said rotatable differential case (8), said support structure (9) supporting the said at least one planet gear (15,16) said support structure (9) being axially stationary to the said side bevel gear (11) of said first differential mechanism, and

(b) one input shaft (19) being axially stationary in / to the said differential case (8), said input shaft (19) having a smooth rounded inner surface throughout it's central stock, and

(c) a first sun gear (7) having an axial opening throughout it's central stock, said first sun gear being axially stationary to the end of the said input shaft (19), and

(d) a first output shaft / drive axle (5) being freely entered through and past the end of the said input shaft (19) and past the said first sun gear (7), the end of the said first output shaft (5) exiting past the said first sun gear (7), into said support structure (9), and

(e) a second output shaft / drive axle (10) being freely entered through the said case (8), the said second output shaft / drive axle (10) being axially stationary to the said support structure (9), and

Claim - 13 (continued [2nd]), Claim - 14

(f) a second sun gear (6) being axially stationary to the end of the said first output shaft (5), and

(g) a gear support shaft / shafts (17,18) being off-centered and stationary in the support structure (9) parallel to the central axis of the differential, and

(h) at least one planet gear (15,16) orbitally engaged to the said first and second sun gears (6,7), the said at least one planet gear (15,16) being rotatively stationary in the said support structure (9) by way of said gear support shaft / shafts (17,18).

Claim - 14 (new), a fully controlled vehicle differential gear according to claim 14, comprising two gear drive / driven differential mechanisms in the same rotatable differential case, said fully controllable differential including:

a first differential gear mechanism, having gear drive / driven members; and

a second differential gear mechanism including:

a support structure (9), two sun gears (6,7), at least one planet gear (15,16), one input shaft (19), and two output shafts (5,10);

wherein:

(a) the said support structure (9) is axially and independently rotatable in the said same rotatable differential case; and

(b) one input shaft (19), being axially stationary in / to the said rotatable differential case, the said input shaft (19) having a smooth rounded inner surface throughout it's central stock; and

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Claim -14 (continued)

(f) a second sun gear (6) being axially stationary to the end of the said first output shaft (5), and

(g) a gear support shaft / shafts (17,18) being off-centered and stationary in the support structure (9) parallel to the central axis of the differential, and

(h) at least one planet gear (15,16) orbitally engaged to the said first and second sun gears (6,7), the said at least one planet gear (15,16) being rotatively stationary in the said support structure (9) by way of said gear support shaft / shafts (17,18).